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THE RATIONAL TREATMENT OF PATIENTS AFTER CATARACT OPERATIONS*.

BY F. C. HOTZ, M. D., CHICAGO.

With the great advancement in ophthalmic surgery, and particularly in the operations for cataract, achieved in the last twenty-five years, it is singular that the spirit of progress so characteristic of our age, has paid so little attention to the treatment of the patients after the operation. If we look around in the ophthalmic hospitals we see the patients treated to-day just as they were treated thirty years ago. We may find a few exceptions, but they are few and far between; and, as far as the text-books represent the position of modern ophthalmology, they too teach the same old-fashioned treatment of cataract patients with roller bandages, dark room and recumbent posture in bed.

It cannot be denied that this treatment is anything but agreeable to the patient, and many patients dread it worse than the operation itself. But, if all this be absolutely necessary for the

*Read before the Chicago Society of Ophthalmology and Otology.

safety of the eye, it must, of course, not be neglected; for the safety of the eye is of greater importance than the comfort or pleasure of the patient. If, however, we could convince ourvince ourselves that the healing process is not disturbed or retarded or the success of the operation jeopardized by omitting one or the other of these measures, it would become our duty to modify our treatment accordingly, for we have certainly no right to subject our patients to any greater discomfort than the safety of their eyes imperatively demands.

In the beginning of my practice I followed, of course, the example of my preceptors, and adopted the treatment as I had seen it in the large eye clinics in Europe. The operation was performed in the patient's room; the eyes were carefully bandaged, he was then carried to bed, undressed, and told to remain quietly on his back; and all light was excluded from the room. When the bandage had to be changed, or I wished to examine the eye during the first three or four days, it was done by a dim candle light. But very soon I questioned the necessity of this darkness; and later on I began to doubt the rationalism of enforced rest and the utility of the prolonged recumbent posture of the patient. I had patients—whom at that time I thought very irrational—who insisted upon sitting up in bed, or even got up to sit in a chair directly after the operation; and to my surprise they recovered just as fast as those who lay in bed on their back as quietly as a log. In the Infirmary the operations were performed in the operating room, and the patients afterwards walked across the hall to their bed rooms; and I could not see that this walk interfered in any case with the healing process. And thus one restriction after another was abandoned: so that for many years daylight has no longer been excluded from the rooms; and during the last two years the patients were allowed to sit up directly after the operation in a rocking, or easy chair, with a high back to rest the head on; they went to bed when they pleased and got up in the morning whenever they liked, and I have observed the patients felt more contented, were more cheerful, and more patiently endured the inconvenience of being blindfolded for several days. I even allowed these patients to walk up and down the room for exercise—of course with a guide—

which has the advantage of obviating the intestinal disorders and the debilitating effect so often induced in old people by too much confinement.

Now, has this treatment any disadvantages? I have discovered none. I have not found the healing to be slower or disturbed by any complications or accidents which could be directly or indirectly attributed to this mode of treatment. The recovery is as quick and the results are as good as under the old regime.

And why should they not? The dark room and the absolute rest of the patient are not among those conditions which modern surgery regards as essential for the prompt healing of a wound of the eyeball. When a wound has been carefully cleansed and thoroughly disinfected; when its edges have been well approximated, it will heal by first union provided the co-aptation of the edges be not disturbed. Therefore, the wound must be guarded by a protective bandage against insults of any kind, and against the disturbing effect of muscular tractions in particular. Rest of the wounded part is the principal condition for a kind and rapid healing. For this reason the surgeon dressing a wound near the wrist puts the hand and arm upon the splint to secure the necessary rest by temporary immobility of these parts. And for the same purpose we bandage *both* eyes after an operation on *one* eye; for as long as both eyes are excluded from sight they remain comparatively motionless, or are at least not subjected to those quick motions they make in looking about. With the action of the ocular muscles thus temporarily suspended and the eyelids immobile the eyeball is afforded all the rest requisite for the healing of the wound. But to keep a man on his back in bed because his eye needs rest is just as irrational as it would be of a surgeon who would put a patient to bed because his hand should have rest. In neither case can the rest of the whole body be of any benefit to the wounded part; but in the case of the eye the prolonged recumbent posture may even have an unfavorable influence by inducing hyperæmia of the ocular tissues.

I therefore agree with Dr. Cheatham (*Arch. of Ophthal.* XIV.-1), that our patients are kept in bed too much. But while

I allow my patients to sit up in chairs and even to walk about the room, I should not let them "walk or ride immediately after the operation or the next day from six blocks to seven miles." It is not prudent to expose a patient after a cataract operation or with a wound of similar gravity to all sorts of weather, nor advisable to send the patient beyond convenient visiting distance; and in our city the sidewalks are not so smooth and level as to make walking an easy and safe undertaking for a blind person.

It stands to reason that the eye should be protected against strong light after an operation; but when the eyes are covered with the proper bandage the light is so thoroughly excluded that it cannot make any difference to the patient whether the room is light or dark; for the attendants, however, it makes all the difference in the world, whether they are imprisoned in a dark room or can enjoy daylight to read and write during these weary hours in the sick room; and for their comfort we should forever abandon the old habit of darkening the room. As long as the operated eye is bandaged, the amount of light is of no consequence; but when the healing has progressed so far that the bandage may be dispensed with, we must take care that the eye is temporarily protected against the irritating effects of strong light either by shading the room or by letting the patient wear smoked glasses.

I cannot persuade myself that the sensitiveness to bright light operated eyes show so often, though not always, when left without a bandage, can justly be charged to the preceding bandaging; for though it is true that if a healthy eye has been closed against light continuously for several days, it cannot bear the the full daylight at once when the bandage is removed, it is a fact too that the healthy eye gets accustomed again to the light in a few minutes, while the operated eye under these circumstances gets more sensitive the longer it is exposed to the light. This difference in their behavior, I believe, plainly shows that the sensitiveness of the operated eye must be due to other causes than the bandage, and if we bear in mind that the operation for cataract does not only affect the sclero-corneal tissue and the iris, but involves to a greater or less degree the whole eyeball,

we may well understand that while the external wound appears well healed, the deeper structures of the eye may not have fully recovered from the effects of the operation, and that on this account the eye is more or less sensitive to the light.

As to the dressing of the eye after the operation there is also a diversity of opinions. While the majority of oculists are still using pads and bandages, a few (Michel, Chisolm), have recently reduced the dressing to a simple strip of isinglass plaster, and others, like Pagenstecher (Wiesbaden), discarding all dressings advocate the open treatment. I do not doubt that the eyes may get well under every one of these different methods, but which of these secures to the eye the best protection against all possibilities which might disturb the healing process? That is the point to determine, which is the best and safest treatment.

Now, if we do not imprison the patient in a dark room we shall not for obvious reasons adopt Pagenstecher's open treatment, because the constant winking of the eye-lids and the frequent rotations of the eye-ball would necessarily have an irritating and distnrbing effect upon the wound. The plaster straps eliminate these sources of disturbance, and, it is claimed, also exclude the light sufficiently so that the patient can remain with comfort in a light room. But the operated eye must also be protected against mechanical insults; and I cannot see that this thin tissue of plaster shall prevent such accidents for instance like the re-opening of the wound on the first three or four days after the operation, if the patient should run his finger against the eye, and this accident is not unlikely to occur considering the great; disposition of patients to finger about the operated eye in order to relieve an itching sensation, or to find out whether it is sore to the touch. I recall at this moment an accident of this kind which happened six days after the operation; the eye had been doing so well, that I left off the bandage over night. At my visit the next morning I was surprised to hear the patient complain of severe pain in the eye which I found very red, watering and tender. The anterior chamber was empty, the aqueous humor oozing from a small opening at the temporal side of the wound. When the patient awoke, he

had felt a great desire to rub his eyes, but came down on the operated eye with greater force than he intended, and the consequence was the re-opening of the wound by the blow. Bearing in mind the possibility of such accidents, I cannot accept the plaster dressing as the best treatment. Besides, I have sometimes employed plaster strips in children after needle operations and iridectomies; but I found the oozing of tears loosened their adhesion and rendered them worthless.

None of these objections can be advanced against the regular dressing with proper bandage. The padding with absorbent cotton or other suitable soft material thoroughly excludes the light, keeps the eye-lids and eye-balls quiet, and securely protects the wound against mechanical injuries.

If the proper material is chosen for the bandage, it will not be disarranged by the movements of the head on the pillow. The common flannel roller, I admit, cannot be kept nicely adjusted, unless a dozen pins are used all over the head; but if we take mosquito netting, or Swiss gauze, and wet the bandage before applying, its several turns become firmly adherent when dry, and form an immobile bandage which can neither be drawn to one side nor come loose by any movements of the patient. Since I have been using this material I have never had any occasion to re-adjust a bandage until I wished to renew it, and I usually leave the first bandage at least twenty-four hours, unless for some particular reason it is desirable or necessary to disturb the rest of the eye by an earlier examination. But if the patient is feeling perfectly comfortable, I hold the less the eye is disturbed during the first twenty-four or forty-eight hours the quicker the edges of the wound will be united.

"THE UNDERLYING CONUS."

BY B. ALEX. RANDALL, A. M., M. D. PHILADELPHIA.

Not a little attention has been given during the past few years to one of the appearances occasionally seen at the optic entrance—a form of *conus* so-called—which evidently differs from the other conditions embraced under the title. Fuchs[1] has been the first to place on record a clear-cut view of the nature of this anomaly, and Szili[2] has further developed the view of Fuchs, that it is a congenital anomaly akin to coloboma of the sheath of the optic nerve. Many others have been studying the matter in silence, regarding it as congenital, but unable to satisfy themselves fully as to its nature; while some have looked upon it as a form of the *supratraction of the choroid* of v. Jaeger[3] and Nagel. Since my attention was first called to it as "*underlying conus*" by Dr. Risley, some seven years since, I have carefully studied its various forms, making sketches of many examples of it, and endeavoring at home and abroad to learn the views of other observers. These opinions, however, have been in most instances very vague; and the published notes upon the subject have been so few, that I am tempted to put a somewhat unusual instance of it upon record, both as a preliminary to a further study, and to invite a like investigation by others.

Mary T. ———, aged 12, came on Jan. 6, '85, to my clinic at the Episcopal Hospital complaining of defective sight. In the functional examination Snellen CC could not be read at twenty feet; but at nine feet with the right eye, and at twelve feet with the left she could see the CLX letter. Jæger No. 1, could not be read; but with each eye Jæger No. IV was spelled at three inches. Externally the eyes showed nothing notable, except some insufficiency of the interni.

The ophthalmoscope showed on the right a rather large optic disk, apparently round, with a pigment band, most marked to the

1 "Beitrag zu den angeboren Anomalien des Sehnerven."—*Arch. f. Ophth.* xxviii, 1, p. 139, 1882.

2 "Der Conus nach unten"—*Centralblatt*, Dec. 1883.

3 "Einstellungen des diopt. Apparates," p. 61.

nasal side, encircling it. This was everywhere rather irregular in density, while down and out its partially absorbed portion deserved to be called an absorbing pigment conus as wide as the retinal artery. There was a large shelving excavation of the disk, deepest at the centre, with the veins entering at its lower portion. The artery emerged from its centre and passed a little to the nasal side before branching for distribution. At the lower portion of the disk was a whitish, glistening crescent, similar in aspect to the broadened scleral ring so often seen at the temporal margin; but to all appearances *underlying* the lower one-fourth of the papilla instead of stretching beyond its margin. Its reflex was the brilliant, yellowish-white of hard fibrous tissue veiled by the overlying nerve fibres—brighter below than the visible portion of the *lamina cribrosa*, but fading above to a vague curved margin just as the lamina was lost beneath the nerve-bundles. The retinal vessels went over it unaltered in direction; and the retinal fibres, unduly visible as striations, passed in upon the disk unmistakably in front of it. Measurement of its level by the refraction through the overlying striations was hardly possible, yet it was clearest with stronger light and with a concave glass additional to that required to see distinctly the adjacent choroid. An aberrant artery (cilio-retinal) emerged from its temporal portion and with a hook-like bend passed off the disk to be distributed to the lower macular region. The retina was markedly striated, the papilla too red, and the choroid full of pigment-clouds, *i. e.*, its vessels uncovered and the interspaces dark with pigment-heaping. There was much difference of level in the eye-ground; the periphery being visible without a glass, while the nerve and macular region required at least — 2 D. to clear up *any* details. The eye was astigmatic and — 3 D. cylinder additional was needed to give a clear picture.

In the left eye the outline of the disk was more quadrate, and its excavation was distorted, shelving toward the upper outer margin, with a more abrupt and prominent lip below. The lower nerve-margin was veiled by retinal striation; and the lower nasal margin presented an absorbing pigment crescent. At the outer margin a similar crescent showed more marked absorption. The central vessels were irregular in their course, emerg-

ing from under the abrupt lower edge of the *porus*—while an aberrant artery, rising through the temporal margin, curved down to supply the lower macular region. Above and to the temporal side was a glistening crescent as on the other side, differing only in its situation and extent. Its horns seemed more prolonged—that to the temporal side being lost in the broadened scleral ring. Its upper margin seemed to be bounded by comparatively normal choroid, its level seemed lower than that of the choroid as well as of the retina, and even at the first glance its peculiar character was unmistakable. Like the other, this eye showed high myopic astigmatism. A mydriatic was ordered and under its use several attempts were made to measure the error of the refraction—at first with unsatisfactory or contradictory results, due to accommodative spasm and inefficient instillations of the atropia at home. On Jan. 23, the accommodation was at rest, and with each eye—3. D. cyl. ax. 180° (horiz.); gave a vision of $\frac{6}{XII}$ m.—a result confirmed by the ophthalmoscope and retinoscopy. When seen shortly afterwards she was comfortable with her glass, and her vision with it was the same.

Any attempt to enter upon a full discussion of the "congenital conus" would require a number of illustrations exhibiting characteristics and variations not to be found in any thus far published, and must be deferred. Such a publication is promised by Szili, and Fuchs has doubtless added largely to his collection of examples since his return to Vienna; while many others have surely been noting the not infrequent instances of the anomaly. The names which have been employed, however, by the writers mentioned ("Sichel" or "Conus nach unten")would not cover a case such as above recorded for the left eye—while the congenital character of the anomaly, however probable, is as yet unproven. In publishing a case, therefore, which shows the same relation to the rare coloboma at or above the macula, which the more usual forms have to colobomata below the disk, I would urge the adoption of the name used by Dr. Risley, as marking a constant characteristic, often overlooked, of the condition in all its forms.

[The illustrations that were to accompany this article have delayed th issue, and will now have to appear in the December number.]

TREATMENT OF DETACHMENT OF THE RETINA.

BY EUGENE HOLT, M. D., PORTLAND, MAINE.
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The article on the treatment of the retina without operation with a case by Dr. Eaton, of Portland, Oregon, reminds me that since I heard Dr. Mittendorf read his paper at the meeting of the American Ophthalmological Society of 1883, I have treated two cases successfully by the remedies suggested in his paper. Two more cases have been treated by the family physician, which were seen in consultation. One wrote me that his eye had recovered, and in the other I verified the successful result by an examination. These are the only cases that have submitted to the treatment, and therefore I have no failures to report.

The history and synopsis of the details of the treatment of the first case are as follows:

Miss A., aged 64 years, of medium height, stoutly built and rather portly in appearance, had always enjoyed good health and had had no trouble with her eyes, except that connected with nearsightedness, until last June ('84); she then noticed a black speck before her right, the best eye. She was then at a watering place and indulging herself more than usual as regards her diet and the use of her eyes. As the obscuration grew larger and annoyed her more, she changed her diet and abstained from using her eyes in reading, etc. In August the trouble had assumed the form of a dense cloud over her eye, causing her to suppose she had a cataract, and now, two months later, there is not much change.

Examination Oct. 18, 1884.

Whole upper part of the field of vision gone. Ophthalmoscope shows the retina have in a grayish wavy appearance in the inferior part of the fundus, the summit of which is seen best with +3 D., while by causing her to look slightly downward the disc is seen best with —9 D., thus showing a subretinal effusion of over four millimeters in depth. She has concave spherical glasses of 8 D. for both eyes which she has worn quite constantly for ten years, and always saw very much better with her right,

the affected eye. By inclining her head forward and a little aslant, vision in R. E., $\frac{2}{LX}$: c — 5 D= $\frac{6}{LX}$. L. E., $\frac{1\frac{1}{2}}{LX}$: c —12 D = $\frac{6}{XII}$. The treatment was begun on November 3, 1884, by restricting her diet to the simplest possible, consistent with proper nourishment. A one per cent solution of atropine was instilled into her eyes sufficiently to completely control her accommodation. Her movements were confined to two large airy rooms, but she was enjoined to remain most of her time in a reclining position. Both eyes were kept bandaged much of the time. The treatment with pilocarpine began by the hypodermatic injection of five minims of a two per cent solution. On the following day eight minims of the same solution were injected into the temple. This, however, caused so much distressing nausea that an infusion of the leaves of jaborandi was ordered, so that she would get one gramme at a dose. She was ordered to take this several times a day in order to continue and increase, the diaphoresis begun by the hypodermatic injections. By using the hypodermatic injections of the pilocarpine in the temple in doses just short of producing distressing nausea, and allowing her to take freely of the infusion, the maximum effect was produced with the minimum of disturbance. This was continued for twenty days, when the grayish, wavy appearance of the retina, which had been seen to gradually disappear, had entirely gone with restoration of the field of vision, and central vision equal to $\frac{6}{XXX}$ with 8 D. sph. The vision further improved and with proper glasses she became in possession of vision equal to that which she had enjoyed for years. Expressing a desire to hear from her from time to time, especially if she should experience any relapse, I will quote from her last letter of March 21, 1886:

"My Dear Sir.—Now that a year and five months have elapsed since, through your skill, the sight was restored to my eye, thought you would like to know that thus far the sight is as good as when first restored. As time goes on I use my eyes for sewing and reading quite freely."

As regards baths, I allowed the patient to continue her daily sponge bath and directed that her attendant use massage, which latter remedy I think a very important one when judiciously

employed, in the treatment of any case where rest is essential to success. The other case was very much like this one in all its features and the details need not be considered. Both were highly myopic and of that class of cases in which the restoration of sight would have been extremely doubtful without the treatment, for the first one, here detailed, had rested and restricted her diet and habits for over two months without any material change in the condition of the eye. When we take into consideration, that, as a rule, these cases go on from bad to worse until the sight is destroyed and the fellow-eye involved in a similar destructive process, and that operative measures are of little or no avail, the importance of this plan of treatment stands out in bold relief to an afflicted class of patients who have had but little done for them. It is extremely doubtful whether any case of detachment of the retina was ever permanently benefited by an operation, or the removal of the subretinal fluid. A careful study of the etiology of this class of cases failed to convince me of the efficacy of any operation for the removal of the subrenal fluid, and although more than twenty cases had been treated before the plan suggested by Dr. Mittendorf had been adopted, with only the reattachment of one retina and the restoration of the sight; yet I feel that my patients received better treatment than though I had done operations for the removal of the sub retinal fluid

A MODE OF DETERMINING THE ABSOLUTE MYOPIA THROUGH THE AID OF GLASSES WITH THE PRISOPTOMETER.

BY H. CULBERTSON, M. D., ASSISTANT SURGEON U. S. ARMY, RETIRED.

In the August number of "THE AMERICAN JOURNAL OF OPHTHALMOLOGY, I published a method of determining the absolute or latent hyperopia with the aid of glasses and the prisoptometer, and without the employment of mydriatics. In the October issue I corrected this article as to the manner in which these lenses act to effect this result.

In this relation, in hyperopia, and also in myopia we wish to ascertain the static ametropia and to exclude the influence of accommodation in the problem, and in both cases the latter is in excess so far as our purpose is concerned. It having been shown that in remote vision the accommodation can be removed in hyperopia by the aid of glasses as heretofore described, and as in myopia the accommodation may also increase (through ciliary muscle spasm,) the myopia; so in myopia the accommodation may be cancelled by the use of + glasses and the static or absolute myopia found without the use of mydriatics in remote testing.

Take a case in illustration, in which the manifest myopia = — D. 10.0, and in which we have found under duboisine = — D8.0 of myopia. It is apparent in this case there is = — D. 2.0 of accommodative myopia. On adding in the holder of the pris optometer a + D. 7.0 spherical glass, the accommodation will be relieved by this lens and the latter will induce = — D. 7.0 of artificial myopia, and this degree of ametropia added to that found under duboisine = — D. 8.0, will give — D. 7.+ (— D. 8.0) = —D. 15.0, as the sum of artificial and absolute myopia. The image circles of the prisoptometer with this + glass applied are greatly lapped. Adding behind the +D.7.0,—D. 15. spheric. the object circles become tangent and the artificial myopia =—D.7.0 is corrected, as well as the —D.8. of absolute or static myopia.

This result has been realized in practice among a number of examples of myopia in which duboisine was employed by myself.

Cases of Myopia.

Case.

Miss C. æt. 16 years, L. eye, manifest —D. 1. 25.

No. 1.—L. eye, with + 7.— (— 8.) tang. = — D. 1.0.
Duboisine gives — D. 1.25.

Miss B. T., æt. 16. Man. — 1.75 R. and L. eye.

2. R. E. +7.— (—8.5) = — 1.5. Duboisine — 1.5.

3. L. E. + 7 — (— 8.0) = — 1.0. Duboisine, — 1.5 six months ago.

Mr. H. D. M., æt. 38. Man. R. E. — 6. L. E. —5.

4. R. E. + 7. — —11.75) = —4.75. Duboisine — 5.0.

5. L. E. + 7.— (—10.25) = — 3.75. Duboisine —3.5.

Mr. L. R. C., æt. 19 years. Each eye. Man. — 3.0.

6. R. E. + 7.—(—9.25) = — 2.25. Duboisine, four years ago — 2.75.

7. L. E. + 7. — (— 9.25) = — 2.25. Duboisine four years ago — 2.75.

Miss C. A. R. æt. 16 years. Man. R. E. — 2.25, L. E. —1.0.

8. R. E. + 7. — (— 9.25)= — 2.25. — Duboisine — 2.25.

9. L. E. +7. — (—8.0) = — 1.0. Duboisine — 1.0.

Miss J. G., æt. 31 years. Man. L. E. — 1.25.

10. L. E. + 7. —(— 8.0) = — 1.0. One year ago, duboisine—1.0.

Miss M. C., æt. 30 years. Man. each eye — 1.75.

11. R. E. + 7. —(— 8.75) = —1.75. Duboisine same.

12. L. E. + 7. — (— 8.75. = — 1.75 Duboisine same.

Miss P. R.T., æt. 19 years. Man. R. E. — 6.25. L. E. — 4.25.

13. R. E. +7. — (— 12.75) = — 5.75. One year ago, duboisine. — 6.0.

14. L. E. + 7. — (— 11.25) = — 4.5. One year ago, duboisine — 4.5.

Mrs. H. M C., æt. 28. R. E. Man. — 6. L. E. — 10.0.

15. R. E. + 7. — (— 13.0) = — 6. One year ago duboisine, — 6.0.

16. L. E. +7. — (— 15.0) = — 8. One year ago, duboisine, — 8.5.

Miss M. C. æt. 23. R. and L. E. Man. — 3.5.

17. R. E. + 7. — (—10.5) = — 3.5. Duboisine — 3.5, six months ago.

18. L. E. + 7. — (— 10.75) = — 3.75. Duboisine — 3.5 six months ago.

In cases of myopia not increased in degree by accommodation the manifest and absolute myopia will be equal. In all other cases of ametropia the following may be formulated.

RULE I.-Add + D 7. spheric in the holder of the prisoptometer and behind this place the — spheric which will cause the object circles to be tangent, and deduct the last from the first and the remainder will be the — spheric denoting the absolute myopia.

A CASE OF INSUFFICIENCY OF THE EXTERNAL RECTI MUSCLES.

BY THOS. FEATHERSTONHAUGH, M. D., ALBANY, N. Y.

It is often helpful to our fellow practitioners to detail a case which has given rise to perplexities in its management. With this view, I collate the notes of a case which was of great interest to me, and which taught me a good practical lesson that has been useful to me on subsequent and somewhat similar occasions.

Mr. H., an unusually robust young man, aged about twenty-four years, a college student in his junior year, consulted me in April, 1881, in reference to his eyes. The subjective symptoms which led him to seek advice were pain in both eyes and head, and confusion or even doubling of objects at a distance. He had lately discovered, too, that he could not easily see near objects with his right eye alone, and he knew that the pupil of this eye had become widely dilated. These, with the exception of the blurring of the right eye for near points, were by no means recent troubles, but had existed with more or less intensity from his earliest recollection. The indications of insufficiency of the

external recti were well marked. The conjunctivæ were injected, and the eyes had the weary, watery appearance so common to asthenopia. V. of each $\frac{20}{XX}$, and all glasses rejected. The pupil of the right was as thoroughly dilated as though atropia had been used, and there was incomplete paresis of the accommodation in this eye. I found by the equilibrium test, with a lighted candle at 20 feet from the patient, that it took prisms of 17° to bring the images in the same vertical line. With a red glass over one eye, there was homonymous diplopia, and again prisms, of 17°, bases out, were necessary to unite the images. If an additional prism of 3° was placed over the 17°, making the sum of the prisms 20°, the images immediately crossed over and heteronymous diplopia was produced. No paresis of any of the motor muscles of the eyeball could be detected. I had, as a rule, never consented to operate in a case of insufficiency where the convergent power was so defective. I like to have the internal recti overcome prisms of 40° or more before interference with these muscles. I had the patient, therefore, come in for a week or more daily, to see whether I could not induce a little flexibility of the internal muscles by gymnastic exercises with the prisms. 2° or 3°, however, in addition to the 15° or 17° necessary to neutralize the insufficiency, proved an obstacle that he could not overcome, and we made no progress. Mr. H. had now become so expert in detecting the double images that he was rather worse than when he first saw me, for the reason that the diplopia, which had annoyed him only at times, was now a pretty constant attendant.

I explained the whole matter, as well as I could, to the patient, and told him that I had decided to operate if he gave his consent. In the early part of May I made a pretty free tenotomy of the internal rectus of the left eye. Immediately after the operation there was still homonymous diplopia, but the images were united by a prism of 6°.

June. Eyes feel very much better, and there is far less confusion. I find that there is still diplopia when the red glass is used, but that, ordinarily, binocular vision is maintained. Insufficiency of the externi by Graefe's test 6°. The patient was now going home for his vacation and further operation was deferred until autumn.

December. Patient overcomes prisms of 32° bases out, and unites the images of the candle readily, without the aid of a prism, even when the red glass is used. He can bear a prism of 2°, base in, and hold the images together. The accommodative paresis in the right eye is gone. There is still some confusion of sight for distant objects, but this occurs infrequently and only when the eyes are thoroughly tired.

I saw Mr. H. at intervals during the winter, but since he was getting along very comfortably and hard at work, nothing more was done until May, '82. At this time he had a little respite from college work, and was desirous of completing the surgery upon his eyes before going to his home to pursue his professional studies. I, therefore, made a tenotomy of the internal rectus of the right eye. Immediately after the operation there was slight heteronymous diplopia, but images were united by a little effort, prisms aggregating 25°, with bases out, were overcome by considerable persistence, while the abductive power was only 4°. The next day, finding the crossed diplopia still persisted, I put in one stitch, merely through the conjunctival membrane, which caused slight homonymous diplopia. This condition righted itself after a day or two, and when the stitch came out, I found, by Graefe's equilibrium test, insufficiency of the interni of 2° to 3° at 20 feet, and, of course, more at near range. When cicatrization was complete, the adductive power came up rapidly, and in two or three weeks prisms aggregating 50° were easily overcome, and the abductive power became 6°. All sense of confusion was now gone and the eyes were perfectly comfortable. In the course of my treatment I had used atropia, and found hyperopia of 0.50 D. in each eye. So small an amount as this seemed hardly worthy of correction.

I have lately received a letter from this patient, in which he says that he has been able to use his eyes as freely as any of his friends; that he studies hard without the least sense of discomfort, and feels confident that the eye question, as far as he is concerned, is solved.

There were occasions, previous to the operations, when the strabismus was readily apparent to even an unskilled observer, and at other times the external muscles seemed to have the

strength requisite to render the axes of the eyes practically parallel. There was, doubtless, a large amount of latent insufficiency, which, of course, I could not detect by the prisms.

The perplexing point in the case was the utter inability to converge the eyes beyond the point where they were accustomed to stand. The logical inference from this state of affairs was, that if tenotomy were performed, making the axes of the eyes parallel, convergence would be nil, and the patient would be seriously crippled for his near work. The issue of the matter shows that *tenotomy of the internal recti improved the converging power in a very marked manner.* The internal recti had done very little work for many years. The convergence of $2\frac{1}{2}$ metre-angles was sufficient for near work, without any special demand upon these muscles, which had, consequently, lost their elasticity. As soon as they were brought into natural use, they recovered their normal tonicity. Ordinarily 6 or 7 metre-angles of convergent power remain in reserve after the adductor muscles have fixed the eyes upon the near point. This great excess of power is slowly expended, and enables the eyes to maintain their convergence for long periods. In the case under consideration there was no reserve power, because none was needed. The convergence here was a *passive condition*, while ordinarily it is a result of active muscular contraction.

Though I have not recently seen the patient, I have no doubt that the insufficiency of the interni which resulted from the second operation was only apparent, and has entirely disappeared by this time. Mr. H. was so accustomed to make excessive traction upon the external muscles in order to secure binocular vision, that he maintained this effort even when the necessity for it was removed.

The semi-paretic condition of the accommodative apparatus of the right eye was the result, apparently, of the constant wearying strain upon the eyes produced by the disarrangement of the delicate relations normally existing between the accommodation and convergence. Had these functions not been restored there is a possibility that serious organic changes would have ensued.

A CASE OF RAPIDLY GROWING TUMOR OF THE BRAIN—ATROPHY OF BOTH OPTIC NERVES WITHOUT OPTIC NEURITIS.

BY D. M. WICK, M. D., NEW HARTFORD, LA., AND ADOLF ALT, M. D.

R.R. was a farmer, single, æt. 27, with dark hair and eyes, of stout build, and apparently a healthy young man, weighing 160 pound. His family history was good with the exception of some form of insanity, which had manifested itself in his father and a younger brother, some years ago, and which had been of a transitory character. The patient's habits were good: he did not use alcohol nor tobacco. There was no history of syphilis. He had always been healthy, save a severe attack of typho-malarial fever eight years ago. After recovering from this fever he was partially demented for a time. He was of fair intelligence.

In the latter part of last March he complained of pain or aching over the eyeballs, and in the region of the temples. These pains began so mildly and insidiously that he paid but little attention to them. But soon they became persistent and increased gradually, yet they were not severe enough to prevent him from pursuing his daily work, nor to interrupt his appetite, nor cause him to lose sleep. After nearly four weeks of such suffering he applied to me for treatment.

On examination, I found the tongue coated at its base, a whitish yellow; the bowels were tight and the breath fœtid. His pulse and temperature were normal. He complained of pain over the orbits and in the temples. He also stated that his sight was dim, and that he was dizzy at times.

Thinking my patient's system needed renovating, and that effete matter had to be eliminated, and that he, further, was suffering from a latent malarial trouble, I prescribed accordingly. He returned to his work and again came to the office three days later. I found him much the same as on his former visit, excepting that entire loss of sight had taken place in his left eye. Externally both eyes appeared normal. The pain in the temples and over the eyes continued unabated. His temperature was normal, the bowels and kidneys were active. I now saw that I had

more than a malarial trouble to contend with, and examined the eye with the ophthalmoscope, but could see nothing wrong except, perhaps, a slightly œdematous condition of optic nerve.

Believing now that there must be some cerebral or meningeal trouble, I prescribed iodide of potassium and small doses of strychnia, and sent him home with instructions to quit work and keep a light diet, as his appetite had now begun to fail. When he came to the office again, two days later, his condition was unchanged, the left eye still sightless.

Desiring to attend the American Medical Association at St. Louis, I advised my patient to accompany me. We consulted Dr. A. Alt, of St. Louis, who made a close examination and placed him on treatment during the week there.

After our return home the patient gradually grew worse, had more pain in the frontal region, became rather listless and stupid; he slept well at night most of the time, and some during the day. His stomach would occasionally reject its contents.

This condition continued until about the 29th of May, when the sight of the right eye became dim, and on awakening the morning of the 31st day of May, he was totally blind. I could now notice that the eye first affected began to protrude and was fixed. He could not move it in any direction. The upper lid drooped. He could sleep reasonably well, and walk around out doors. He became peevish, fretful, morose, and wanted some one to take his life; but was conscious all the time.

Thus he remained week after week, only growing weaker. Both eyes became bulged out, the upper lids drooped. The left eye protruded more than the right, yet before death the right one protruded the most. The exophthalmus was so enormous that it actually seemed as if the eyes would pop from their sockets. The conjunctiva of both eyes became filled with a bloody serum and protruded between the lids, making a most hideous object to look upon. His nose bled frequently; he would blow and pick it to make it bleed, and he would not allow anything to be done to check the bleeding, as he wanted to bleed to death. He grew very obstinate, peevish and stupid, and kept his bed most of the time. About the middle of July he became totally unable to leave it; he now fell into and remained in

a semi-conscious condition; but he would complain at times of his head. From now until death he gradually became more unconscious, and passed his water and evacuated the bowels involuntarily. He died Aug. 15.

Dr. D. W. Crouse, of Waterloo, saw the case with me six or seven weeks before death.

Autopsy.

August 16, with the aid of Drs. Powers and Donaldson, of Parkersburg, and Dr. J. S. Stevens, of Cedar Falls, we made a post-mortem examination of the head only. After removing the skull-cap, the membranes of the brain were found to be intact and appeared healthy. We began at the base of the brain to dissect or rather roll out the brain *en masse*, and in so doing we made good progress until we reached the anterior lobes of the cerebrum. Here the coverings of the brain broke down, exposing a soft pulpy mass of brain tissue, with here and there a hardened lump, that gave a gritty sensation to the touch. Some of these lumps or chunks were an inch or more in diameter, and irregular in shape.

The whole anterior part of the cerebrum was diseased, and the membranes destroyed, the diseased condition gradually merging into the healthy tissue. The orbital plates were entirely destroyed and the orbits were filled with the same tissue observed in the anterior portions of the brain. The optic nerves appeared intact, but surrounded with diseased tissue. I sent brain and globes to Dr. A. Alt, of St. Louis, who will give the result of his investigations.

Additional Remarks.

BY ADOLF ALT, M. D.

I saw Mr. R. R., the patient of Dr. Wick, for the first time May 6, 1886. The conditions were then as above stated, L. E. V. =0. The ophthalmoscope revealed a very slightly œdematous outline of the papilla, which itself was hyperæmic. The retinal arteries were very thin. The R. E. showed nothing pathological. The question which arose was whether we had to

deal with a simple retro-bulbar neuritis, or an intra-cranial affection. The frequent, almost continued, headaches he complained of rather pointed to a cerebral disease. Yet, the absolutely normal appearance and vision of the right eye, seemed to speak against anything like a cerebral tumor.

I made a trial injection of gr. $\frac{1}{10}$ of strychniæ subnitrate, after which he had at least a distinct perception of a candle light close to the eyeball. (I may here state, that in another case of undoubtedly cerebral tumor with a high degree of optic neuritis and seemingly total blindness, several such subcutaneous injections of strychnia, brought vision temporarily up from 0 to $\frac{8}{cc}$. This patient soon after died from her tumor.)

The history of the case, as given by Dr. Wick, made it soon plain enough, that we undoubtedly had to deal with a cerebral disease, but the extremely rapid growth, which became manifest by the invasion of the orbits and the rapidly progressing exophthalmus, was rather startling.

The specimen, so kindly sent to me by Dr. Wick, showed that the tumor, after having destroyed, the anterior lobes of the brain, the thalami optici and the chiasma nervorum opticorum, had broken through the walls of the orbit and filled the orbital cavities. Both optic nerves were thus embedded in the tissue of the neoplasm. Near the eyeball the tumor has not invaded them, but for the distance of about one-half inch from what would correspond to the apex of the orbit towards the eyeball, both optic nerves are invaded by the elements of the tumor, and the nerve fibre bundles are greatly diminished in number and size, or, in other portions, have totally disappeared. The orbital portion of the tumor shows a great many blood vessels. The right eyeball shows a necrosis ulcer of the cornea, which is just ready to break through. The left cornea is also ulcerated, but has been perforated; the iris has prolapsed, the crystalline lens is wanting, and the retina is totally detached.

The elements of the tumor are uniformly medium sized round-cells, among which lies here and there a giant-cell. There is an abundance of capillaries in some portions, and in others an alveolar arrangement of the cells caused by tracts of dense connective tissue. The orbital portion contains a great many micro-

scopical spiculæ of bone-tissue, which are the remnants of the orbital walls, and not, I think, newly formed, since they are only surrounded by the round-cells of the tumor, and no osteoblastic cells are to be found.

The anatomical diagnosis would, therefore, be *round-cell-sarcoma*.

The histological changes in the tissues of the eye-balls are of no particular interest.

The interesting features of the case are the rapid and enormous growth of the neoplasm, especially, if we take into consideration what an obstacle had to be overcome in the shape of the bony walls of the orbits, before these cavities could be invaded, and the fact, that blindness had occurred, before any very noticeable degree of choked disc had had time to make its appearance. This latter fact would seem to prove that the tumor originated in or very near one of the optic nerve tracts (probably the thalanus opticus). Yet, there was no hemianopia of the right eye even at the time when I examined the case.

CLINICAL OBSERVATIONS.

BY DR. PAUL B. WALDMAN, READING, PA.

I. Astigmatism after Tenotomy of the Internal Rectus.—Miss A. Y., æt 18 years, presented herself Nov. 1, 1885 with convergent strabismus of the left eye. Upon examination of the vision and refraction, the following result was obtained.

R. V. = $\frac{15}{XV}$ +; E.

L. V. = Fingers at eighteen inches. No improvement with glasses.

Ophthalmoscopically the left eye has H. = 2 D.

Under atropia R. V. = $\frac{15}{XV}$ w. + 5 D.

Tenotomy was performed on the squinting eye on Nov. 5, and on the right eye Dec. 11, with straight eyes as a result.

On June 20, 1886, she presented herself, stating that since the operation she could not see as well for distance as before the operation, and that she was unable to perform near work with comfort. Upon examination it was found that marked astigmatism existed, viz.

R. V. = $\frac{15}{XL}$; $\frac{15}{XV}$ + w. — 1 D. cy. ax. 180°.

I am unable to state in what proportion of cases astigmatism follows tenotomy, but am inclined to think it would be found to exist more frequently after free tenotomies, if looked for; i. e. astigmatism of less degree than in the above case, probably from .25 to .5 D.

II. Eserine Salicylate in Accommodative Asthenopia.—We often meet cases in which the symptoms of asthenopia continue (perhaps in not so marked a degree) after they have been fitted with suitable glasses. I refer to cases without any disturbance of the general health, or insufficiency of the recti muscles; the trouble apparently being due to a want of tone in the ciliary muscle or its nerve supply.

For some time I have been using salicylate of eserine in addition to suitable glasses, in these cases, and with marked success. I use from one-half to three-fourths of a grain dissolved in one ounce of a saturated solution of boracic acid, as a collyrium at bed-time; being guided by the sensitiveness of the patient.

The remedy seems especially indicated where the pupils are large and sluggish.*

III. Profuse Hæmorrhage During the Operation of Exenteratio Bulbi.—E. M., æt. 29 years, a robust and healthy man; has never had more than perception of light in the right eye.

On July 18, 1886, he received an injury from a large piece of iron striking the eye. He was treated elsewhere until he presented himself to me on Aug. 10, with symptoms of sympathetic irritation.

Besides atropine and hot fomentations, I gave him a hypodermic injection of pilocarpine daily, with slight improvement. The eye then remaining in the same condition, I advised removal of the anterior part of the globe, and wiping out its contents, to which he readily consented.

On Aug. 25, I performed the operation of exenteratio bulbi. There was no unusual bleeding until I began to tear the choroid from the sclerotic, when profuse arterial hæmorrhage set in, necessitating the completion of the operation while the hæmorrhage continued. Cold and pressure were then applied, which checked the flow of blood. I estimated the loss of blood to have been about ten times that occurring during an ordinary enucleation.

The eye made a good recovery with a favorable stump.

*The use of myotics in those conditions has some five years ago been advocated by Dr. John Green of this city in a paper read before the American Ophthalmological Society. (Editor).

RETINOSCOPY IN EXTREME DEGREES OF AMETROPIA.

J. H. THOMPSON, M. D., KANSAS CITY.

By far the most difficult chapter of ophthalmology is the one on refraction and accommodation of the eye. Thanks to the labor of Donders, and others, the specialist to-day is better prepared to remedy the different errors of refraction, and in many instances able to appreciate the danger and annoyances such abnormalities may occasion. To properly fit a pair of glasses, or spectacles, is indeed an art, even if it be a in simple case of hypermetropia. But to correct by lenses, either simple or compound, the different grades and characters of nearsghtedness, so that comfort is secured and the danger of progression removed, is an accomplishment. Such a task is often extremely difficult; without the aid of the ophthalmoscope it is well-nigh impossible. As a rule, high degrees of myopia cannot be measured by that instrument; we may approximate the amount of error, but cannot be certain that our measurement is exact. In many instances this method of estimating the error of refraction is more than difficult, because myopia greater than $\frac{1}{4}$ is usually complicated by regular, less frequently by irregular, astigmatism, and as a rule such eyes are amblyopic to a varying degree. I think this is yet more apt to be the case in high degrees of hypermetropia. In theory, it is possible to make an accurate measurement of such conditions, but in practice, we all know it is very different. The same elements of uncertainty meet us

if we attempt to measure ametropia of a high degree by trial-lenses and test-types. What I have said of measuring the refraction with the ophthalmoscope is equally as true for this method. The cause of the difficulty lies in the amount of amblyopia usually found in high degrees of ametropia. If $\frac{20}{XX}$ vision is to be considered the only indication of correctness, a very large per cent. of myopes must wear unsuitable glasses, and in consequence would be in danger of progression and insidious intra-ocular inflammations. In fine, I mean to insinuate, that it is impossible in many cases of high degrees of myopia or hypermetropia to find the exact degree of refraction by the methods generally in use; that in, myopia, (either simple or compound), uncertainty often leads to an only approximate correctton by glasses, and guessing in this regard is not only annoying to the surgeon but harmful to the patient. In the Section on Ophthalmology and Otology at the last meeting of the American Medical Association, Dr. Jackson, of Philadelphia, presented a paper on "Retinoscopy." In the discussion, I made the remark that I believed that method of investigation would prove of great value in measuring the refraction accurately in cases in which with the ophthalmoscope and trial lenses we were uncertain.

The method of "Retinoscopy" is somewhat new, and of course by some will be extolled beyond all others in the fitting of glasses. I am inclined to believe that it will be abused by being practiced on all cases, and, contrary to the opinion of some, I do not think in general use it will prove advantageous. In low degrees of ametropia it is not only tedious, but even not so certain or convenient as either the ophthalmoscope, or test-lenses. It is in very high degrees of ametropia that retinoscopy is of the greatest value. Inasmuch as by this method we can dispense with the help of the patient, and inasmuch as the depth or shallowness of the eyeball is an aid rather than a detriment to its practice, I am convinced that it will not be long before the "shadow test" will be universally used in these cases. As a supplement to these remarks I desire to report three cases of extreme myopia measured by this means.

Compound Myopic Astigmatism.

Case 1. Miss DeC., age 26.

The patient stated that when a young girl she could see well (?) Then at school she had no trouble to read or take part in the blackboard exercises. When about ten years old, she found that her eyes began to fail her, and that she was compelled to use glasses for distant vision. The spectacles she changed frequently, finding that it became necessary to get stronger ones at short intervals; finally the strongest failed to suit her. She visited a specialist, but the spectacles he ordered caused so much discomfort that they were discarded. Finally, it became impossible for her to sew, or read longer than a few minutes at a time. When the lady consulted me the pupils were moderately dilated. Her eyeballs, from external appearance, did not seem to be elongated. Motility good.

I tried to find the degree of myopia by trial lenses, but because of the astigmatism and the large amount of amblyopia I could not. I again made an attempt after having instilled atropia, but the best I could get her vision to was $_{L}\frac{20}{XXX}$. I could not measure the refraction with the ophthalmoscope, for I must admit my inability to see the fundus distinctly when the myopia is greater than $\frac{1}{3}$. Even if I could have done so, the astigmatism in this case would have made it well nigh impossible. There was large posterior staphyloma with patches of pigment scattered about the edge. Otherwise the interior of the eyes was normal. Because of the rapid progression it was imperative that the exact condition of refraction should be known. I now tried retinoscopy, and in a very few minutes I found a compound myopic astigmatism—14 D. ⌒ — 3.5 D. cyl. over 180°, same in both eyes. Thus combined glasses gave a vision of $\frac{20}{XL}$.

I prescribed —10 D. ⌒ —3.5 D. cyl. 180° for distance; — 7 D ⌒ —3. 5. cyl. 180° for reading. These spectacles gave satisfaction, although the total myopia was not corrected. I thought it best to be on the safe side, even at a slight sacrifice of distinct vision.

Compound Myopic Astigmatism.

Case No. II.—Mary M., æt. 17. Nothing unusual in the appearance of the eyes other than a moderate dilatation of the pu-

pils. On account of a marked degree of amblyopia the face had a rather foolish expression, otherwise the girl was in a good condition, both mentally and physically. She said she never saw distinctly, and within the last two years vision had grown much worse. Reading and sewing caused pain; all nearwork was badly done because of the increasing blindness. Several persons had given her glasses but none fitted her. The inverted picture of the fundus showed posterior staphyloma, slight pigment alterations, but no sign of acute trouble either in the choroid or retina. It was impossible to make out any of the details by the direct ophthalmoscopic observation. I could see, however, that there was considerable astigmatism. With trial lenses, simple or compound, the examination was very unsatisfactory. There was so much amblyopia, that $\frac{20}{C}$ was the best vision I could produce. On account of the extreme degree of myopia and the comparative blindness, I felt it was very necessary to know the exact refraction. Retinoscopy gave it in five minutes. Both eyes: —12 D. ⌒ 2.5 D. cyl. 180°. After atropia reads at 8 inches, with —7 D. ⌒ —2.4 D. cyl. 180°. Advised to keep up the atropia for one month. Prescribed compound glasses fully correcting ametropia for distance. These glasses gave satisfaction, and can be used for hours without pain or annoyance.

Compound Myopic Astigmatism.

Case III.—Master L., æt. 13.—From the number of the glass the young man wore when he entered my office and that which he accepted, I was inclined to think that he had either been very badly fitted, or that there had been dangerous progression in his myopia. He said that six months ago his spectacles fitted him, and that at first he saw quite well (?), but of late his vision had grown rapidly worse. Because of extreme amblyopia or much irregularity in the astigmatism, I could not satisfy myself with the trial lenses with regard to the exact refraction. To see the fundus and measure the refraction with the ophthalmoscope was simply impossible. I then tried retinoscopy, and found —7, 0 D. ⌒ —5. O D. cyl. axis 180°. This combination made V = $\frac{20}{Lx}$. No other glasses would do as well. I ordered

—7, D. ⌒ —5. 0 D. cyl. 180° for distance, and advised that the eyes be absolutely rested for one year.

These three cases I have reported because I believe they fully demonstrate the usefulness of retinoscopy. I am not enthusiastic over this method of examining the refraction, but I do believe, that in some cases of ametropia and in some respects, this is the best means we have to secure a perfect measurement and correction.

Review.

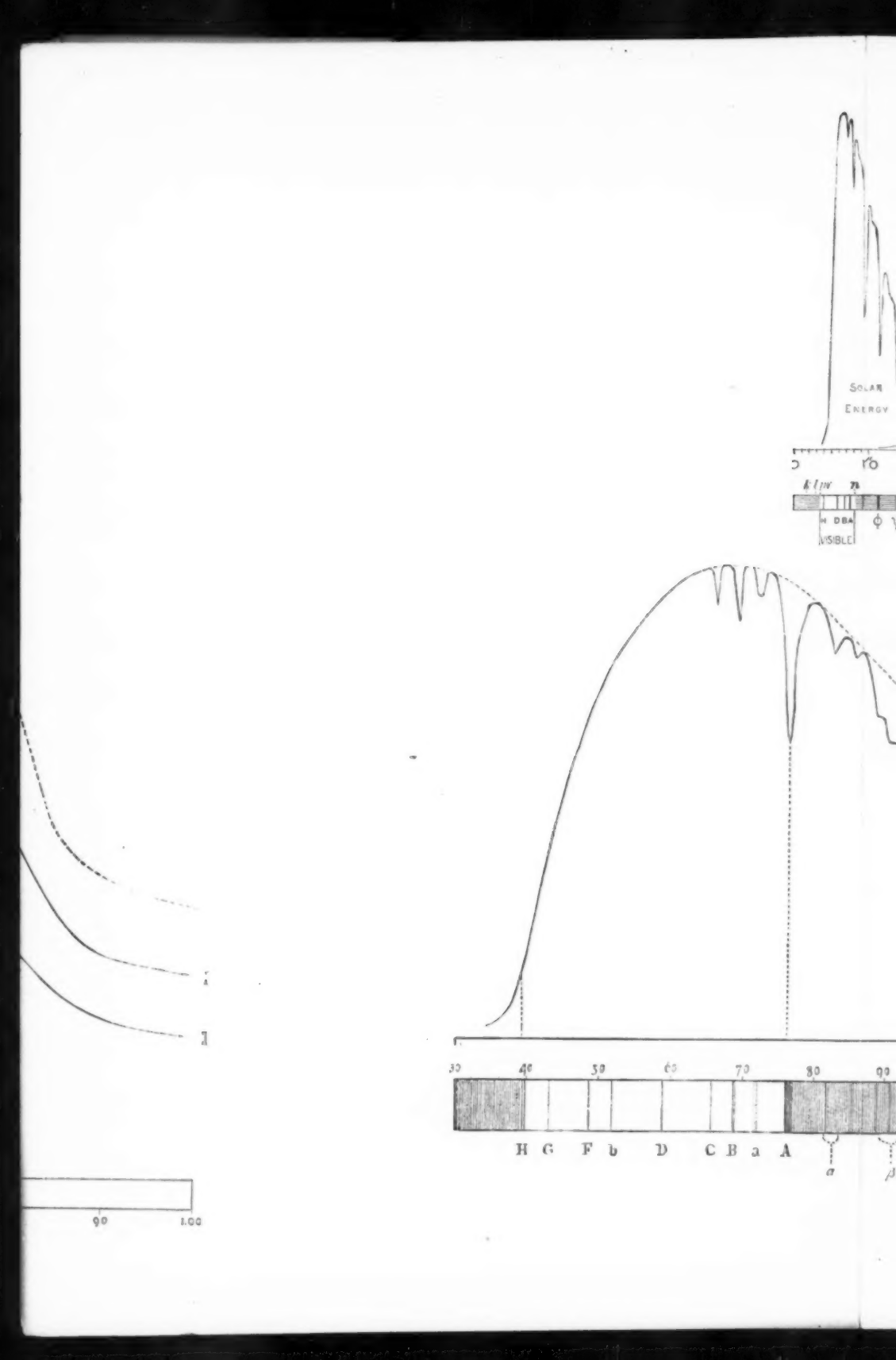
A Compend of the Eye; Including Refraction and Surgical Operations. By L. Webster Fox, M. D., and G. M. Gould, A. B., Philadelphia, P. Blakiston, Son & Co.

We have received an advance copy of this little quiz-compend with the above title, which has for authors two of our collaborators, and is No. 8 of a series of quiz-compends published by the firm of Blakiston.

It gives in a very condensed and clear form the most necessasary points on the subjects it treats upon. The text is well arranged and subdivided. It has, furthermore, a great many excellent illustrations, which heighten its value for the student, to whom, we think, the little book is especially to be recommended.

There is a number of points in it with which we cannot quite agree, but which on the whole do not, therefore, detract any of the value of the little work, which in many places shows the originality of its authors.

The authors, for instance, say: "Epilation should be repeatedly tried for distichiasis and trichiasis before trying the surgical operations." Why?—They recommend to slit the *lower* canaliculus in dakryocystitis. We think the upper one preferable.—They call military and Egyptian ophthalmia a synonym of *purulent* conjunctivitis, but never mention these names as synonyms of trachoma, where they more properly belong, although a chronic purulent conjunctivitis *with* the formation of follicles has also been given these names.—The passage on diphtheritic and croupous conjunctivitis does, it seems to us, not do justice to these important forms of conjunctivitis.—In the treatment of trachoma sulphate of copper, the most reliable remedy in our opinion, is not even mentioned, and in the less malignant lupus alum crayon is recommended, which we think not worth the mentioning.—The authors make a distinction between hysus, *tumors*, epitheliomata and sarcomata of the conjunctiva. This is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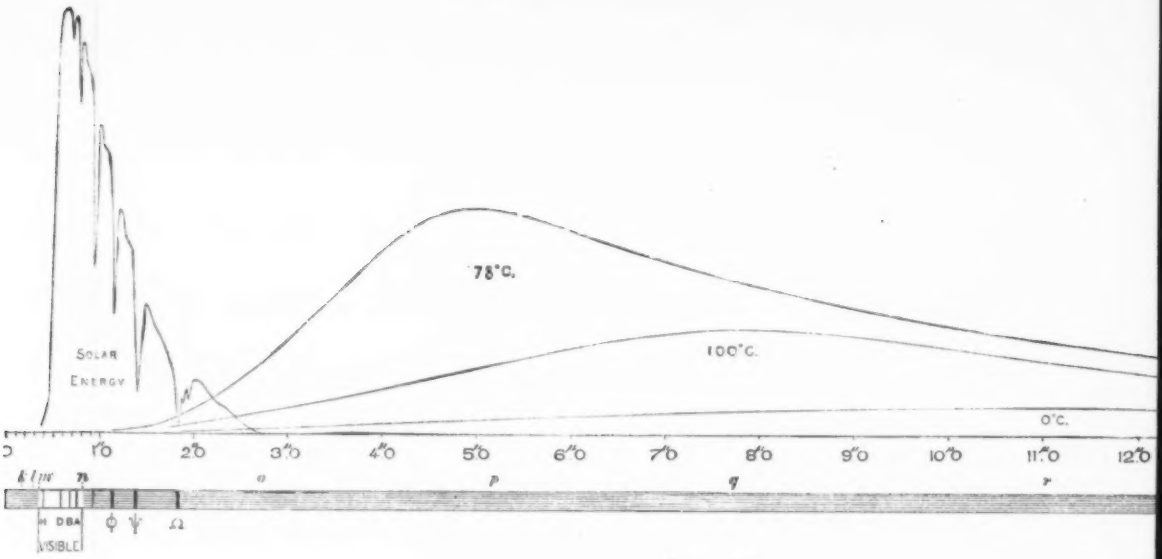
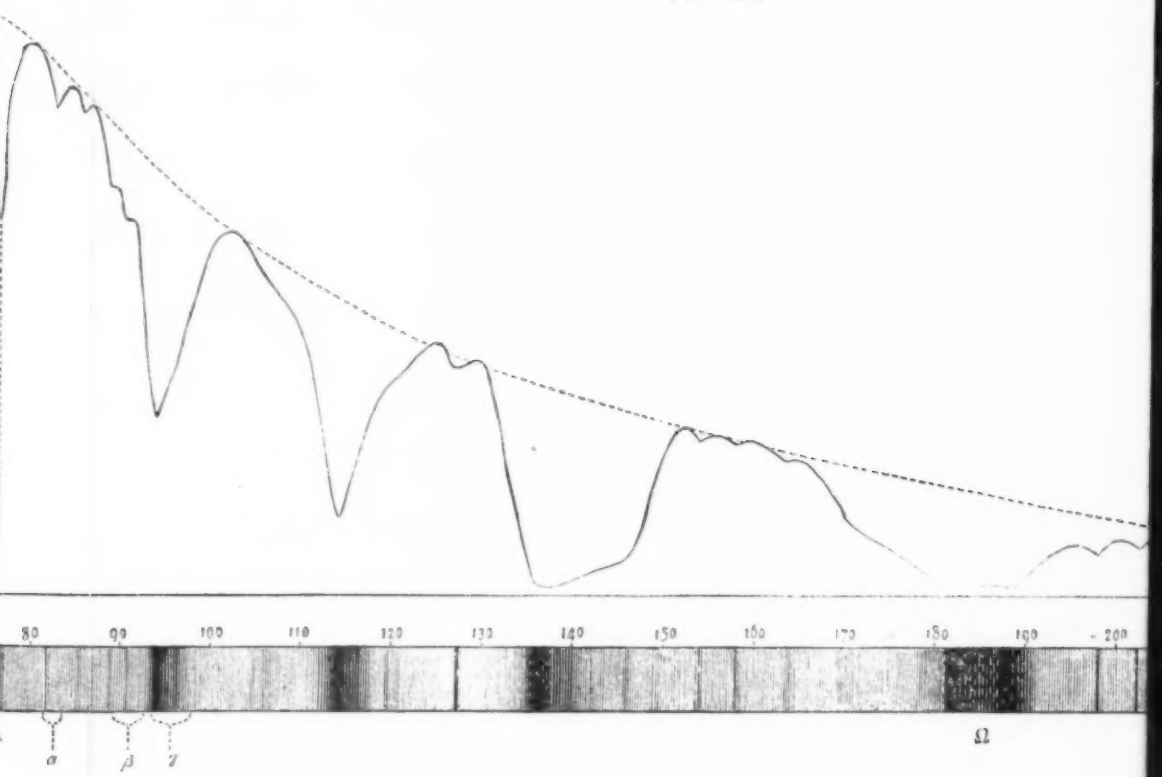
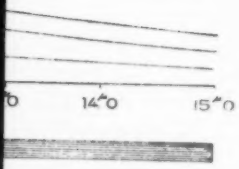


FIG. 19.



NORMAL SPECTRUM.
FIG. 20.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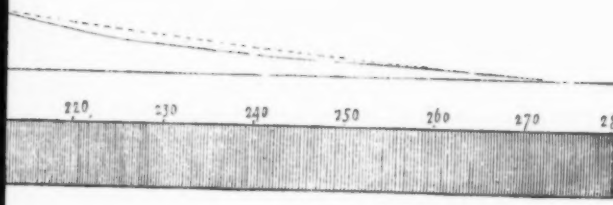
15°0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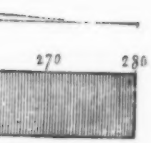
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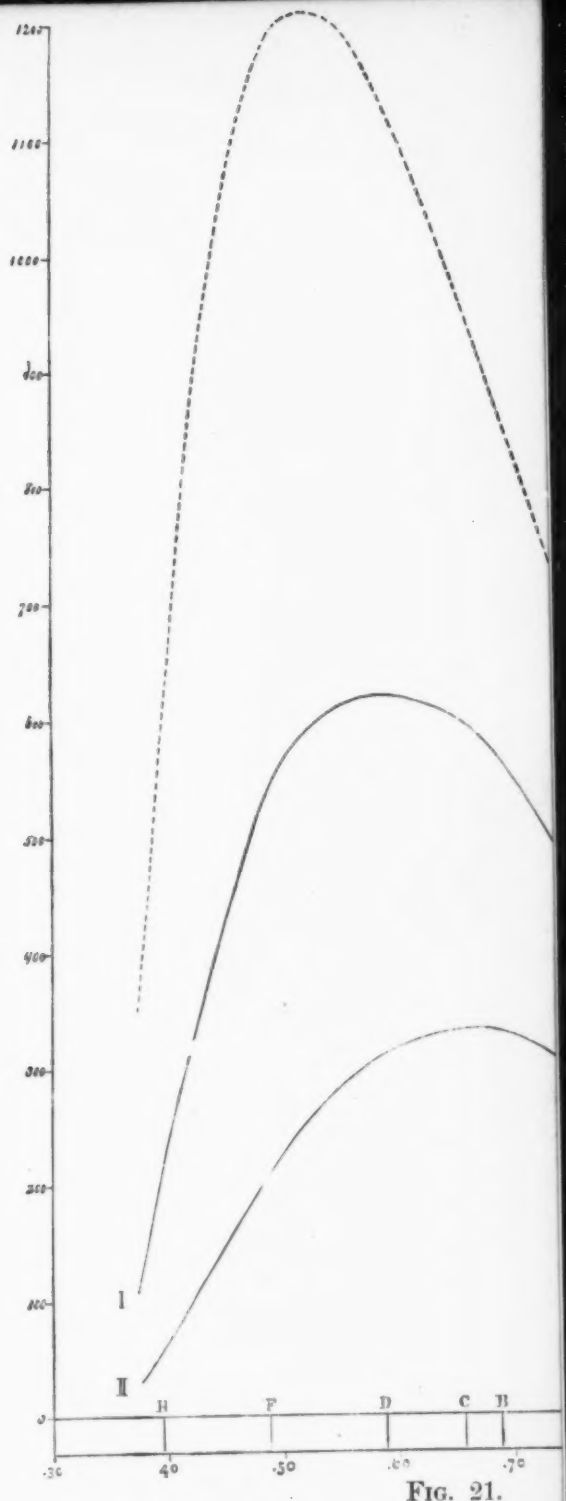

FIG. 21.